Norwalk Aquatic Center Evaluation Report
Norwalk, Iowa
March 24, 2016
By Michael J. Fisher, P.E.

Opinions of Probable Construction Costs reflect current values that could reasonably be associated with the scope of work identified. Many variables could impact actual costs for Contractors interested in the work.

Michael J. Fisher, WEAD, April 4, 2016

Background

Michael Fisher, a Professional Engineer from Water's Edge Aquatic Design visited the Norwalk pool facility on March 10, 2016 to review the pool, bathhouse, and pool mechanical components and to speak with operating staff. This report summarizes the findings and offers opinions on improvements for the facility.

This facility was constructed in 1991 and consists of three pools (main pool, plunge pool, and baby pool) a bathhouse and a filter building.

The purpose of this report is to convey the findings of the evaluation of the Norwalk Aquatic Center. And based on these findings, identify the deficiencies that could prevent safe and efficient operation of this facility for the upcoming 2016 swim season as well as the deficiencies that should be addressed for continued operations for another 10 years.

Standards and Guidelines Summary

This report focuses on the physical condition of facility, but also compares the existing facilities to current state, federal and international design standards, guidelines, and building codes where necessary. Following is a list of the major regulations, codes, and standards that are of consideration in this report.

- Swimming Pool Rules by Iowa Department of Public Health (IDPH)
- Federal Virginia Graeme Baker Pool and Spa Safety Act (VBGA)
- The Americans with Disabilities Act (ADA)

The most applicable swimming pool health department standard is from the Iowa Department of Public Health, as well as the VGBA- which was passed in 2008 requiring all public swimming pools meet minimum safety standards pertaining to submerged outlets.

ADA requirements were originally passed in 1990; however, recreations facilities, such as swimming pools, were not specifically addressed. In 2004, guidelines addressing recreational venues were published. In 2010, the 2004 guidelines were officially signed into law by the U.S. Department of Justice.

Basic Description of Existing Facility

Basic Pool Data:

- Main Pool: 4,540 S.F. water surface area, 300 L.F. perimeter, 130,260 gallons, 425 gpm recirculation flowrate, depths varying from 0 to 10'.
- Plunge Pool: 377 S.F. water surface area, 84 L.F. perimeter, 8,565 gallons, 74 gpm recirculation flowrate, depths varying from 2'-10" to 3'-6".
- Baby Pool: 490 S.F. water surface area, 78 L.F. perimeter, 1,730 gallons, 33 gpm recirculation flowrate, depths varying from 0" to 8".

The Main Pool consists of a zero-depth entry at the north end and a diving well at the south end. In the middle is an area designed for lap swimming. The pool has a raised-deck gutter with PVC grating and is designed for in-pool surge. Surface is a plaster coating. Features include a 1 meter diving board. Ladders, an ADA lift, and portable lifeguard chairs are also components included in this pool. The pool includes underwater lighting. Water remained in the deeper portions of the pool during observations.

The plunge pool consists of a rectangular basin with raised-deck gutter with PVC grating. It too is designed for in-pool surge and has a plaster surface. A waterslide enters at the north end and stairs along the south end. The surface between the deck and the gutter grating has ceramic tile. Water covered the bottom at the time of observation.

The baby pool is a small round basin with zero-depth entry around the perimeter. A concrete dolphin spray feature is at the edge of the pool and a PVC pipe spray feature is at the center.

The deck around the pools consists of broom-finished concrete. Four light poles with 2 fixtures each provide for overhead lighting. Underwater light transformers are also placed on the deck at the deck perimeter. The perimeter fence is 6 foot tall, some fence with galvanized finish and some with PVC coating. There is a 4 foot tall interior fence separating the concessions area and the baby pool from the rest of the facility.

The pool water treatment systems consist of three horizontal sand filters for the main pool, and single vertical sand filters for each of the other two pools. Horizontal centrifugal pumps are floor mounted above the pool water level along with strainer baskets. Pool heaters are included within the two larger pool systems. A calcium hypochlorite system provides disinfection for each of the three systems. The water treatment system for the baby pool has not been in operation for some years. The water feature pump on the baby pool has been disconnected from the piping. Water fill systems include both manual feed and an automated water feed system for each pool.

The filter building consists of a masonry wall construction on one end with the majority of the wall construction being wood. The building has a chemical room, filter room, and a storage room. The roof structure is wood with composition shingles.

The existing bathhouse includes a male restroom, a female restroom, a lifeguard restroom, a manager office, admissions/lifeguard room, a concessions room, and other utility rooms. The roof structure is wood with composition shingles. The walls are concrete masonry units. The floor is concrete.

General Summary and Considerations

The main pool basin and plunge pool basin are both in good shape overall. There are some relatively minor repairs that need to be made such as repairs to a few areas of delaminated plaster surface and tile replacement. Simple bolt-on type features could certainly help the pool to be more attractive with more modern trends. The waterslide appears to be in good shape, with some attention to the metal support structure.

The baby pool could be restored, but the extent of construction to do so may not be worth the value to the public for only 10 years, especially since the main pool has zero depth already. A more costly renovation of this area could include a sprayground. A lower cost option for dealing the baby pool would be to remove it and the adjacent deck and replace it with a grass deck. Grass decks are a welcomed trend in today's aquatic facilities.

The concrete pool deck is also in good shape overall, but could use some minor repairs. There's a good chance that the deck drainage issue could be resolved without extensive replacement of the trench drain system, but with a focus on the drain path after leaving the pool facility. Original design did not connect the drain discharge to a storm sewer system. Current lighting is likely inadequate for night swimming.

The issues associated with the pool mechanical systems are probably the major issue with this facility. Operations could be made much simpler with having pumps located below water level so that they don't need primed. While the filters are rated to handle the flows required, a larger size filter would do so with less hassle and more effectively filter. Replacement of the chemical feed systems and controller with a more operator friendly and safer one would help operations. New, more efficient pool heating systems will be much less challenging to operate and will reduce utility costs. The backwash waste is believed to flow into the nearby stream in lieu of the sanitary sewer system. This is likely not acceptable unless permitted with DNR.

The building structures are in need of some typical periodic maintenance – replace select plumbing fixtures, replace rot, paint and re-roof. The bathhouse is has plenty of overall square footage, but could function better for the staff and for the patrons with some internal renovations such as expanding concession storage, create a corridor entrance, add lockers, create family change room, include mens shower partitions, and include new admissions, office, and lifeguard rooms.

Recommended specific modifications to be performed for the 2016 swim season Total: $90K to $100K

Pool Water Treatment Systems

$20K
- The primary pool chemical treatment system currently used is a Calcium Hypochlorite based system (Pulsar). Treatment using calcium hypochlorite ("solid") is generally more costly and labor intensive than other forms (liquid and gas) of treatment using chlorine as the source disinfectant. The current system is in need of replacement, so replacement with a more efficient form of a disinfection chemical system is recommended prior to the 2016 swim season. Sodium hypochlorite (often referred to as bleach or liquid chlorine) is the most common disinfection used for municipal pools as it is more effective than calcium hypochlorite and safer for the operators than gas chlorine and calcium hypochlorite. It requires bulk storage tanks and an appropriate chemical feed pump to inject into the pool piping. Also it will require a pH balance chemical such as Muriatic Acid, which also require a bulk storage tank and a pump. (Note that the chemical room floor drain appears to go to storm sewer instead of sanitary – so secondary containment of the chemicals is recommended and could be accomplished by double wall tanks.) Enhancements to the chemical room ventilation system will need to be performed to accommodate the more corrosive environment that these chemicals introduce.

$1K
- Potable water is added to the pools by operating existing valves located in the chemical room. One of these manual PVC valves and one of the automatic water feed systems is not functioning properly and should be replaced prior to the start of the next season.

$1K
- The existing plunge pool heater flue has come apart and should be fixed prior to operation.

$1K
- Replacement hardware on the strainer basket of the waterslide pump have degraded and should be replaced prior to the upcoming season.

$1K
- The electrical disconnect panel for the slide pump is not secure to the wall and should be secured with stainless hardware prior to the 2016 season.

$0K
- The baby pool system has not been in operation for a number years primarily due to offsets within the pool and deck slabs. Restricting the access to the baby pool by the public continues to be a reasonable option and therefore no changes to baby pool system.

Pool Structures

$0K
- The baby pool has been closed to the public and has significant offsets at the surface of the pool/deck that are trip hazards. Obviously, vertical movement of the slabs at these joint has occurred, likely due to settlement of the subgrade. Gutter grating has been broken and is hazardous. The pool has two spray features that physically appear to be safe for operation. It is recommended to continue to deny patrons access to this baby pool for the 2016 swim season.

$1K
- Both the plunge pool and the main pool have floor and wall inlets that are missing diffusers and orifices, respectively. These should be replaced prior to operation.

$2K
- The structural integrity of the pool gutter grating has been compromised in some areas and needs to be replaced prior to the next swim season.

$1K
- One of the pool caulk joints has been compromised and should be re-caulked to reduce the potential for pool leakage during the upcoming season.

Bathhouse and Filter Building Structures

$15K
- Ventilation of the Filter Building is inadequate for combustion air for the pool heaters. And forced ventilation should be installed in the chemical room to remove the more concentrated chemical laden air. Ventilation should be addressed prior to operation of the pool heaters and delivery of chemicals.

$1K
- Chemical warning signage on the exterior of the filter building are inadequate and should be addressed prior to chemical delivery.

$1K
- A light on the motor starter panel for the slide pump is missing, leaving a hole in the face of the panel. A new light should be installed or the hole plugged prior to operation.

$1K
- A fan has been set up to circulate air across the motor starter panels in order to keep the electrical systems operating. An electrician should check to see if the thermal overload protection settings of the panels can be adjusted to allow operation at a higher temperature. If not, the fan will still be needed to cool the panels for the coming swim season.

$1K
- The roll-up door at the entrance window of the bathhouse has been problematic to staff when it is raised too high. Custom stop hardware could be installed to limit the height that the door can raise.

Pool Deck and Site

$3K
- Much of the chainlink fence within and around the perimeter of the facility has open selvage at the bottom and there's a notable gap between from the fence fabric to the deck surface. This could allow punctures to feet that get under the fence fabric. The fence fabric should be lowered to reduce and/or eliminate the gap prior to allowing patrons in the facility.

$8K
- The metallic edge on some of the waterslide step treads has corroded to the point that it has sharp edges. Removal of the corroded metals, rounding off any sharp

edges, and applying a protective coating should be performed prior to allowing patrons to use the slide.

$1K
- One of the PVC conduits to an electrical box above the deck along the perimeter fence is broken, exposing the wiring within. This conduit should be repaired before allowing patrons near it.

$3K
- Lighting for use of the facility after dark appears to be inadequate based on the apparent size and quantity of overhead light fixtures. Verification of the light levels on the deck and at the water surface should be verified with a light meter. Electricians often have light meters and could take readings. Recorded readings should be compared to the Iowa Department of Public Health (IDPH) requirements. Swimming after dark should be restricted until light levels are confirmed to be adequate. Light fixtures have been removed at the front entrance of the bathhouse.

$7K
- There are a few locations within the deck that there are offsets at deck joints. These can be a trip hazard, toe-stubber, and restrict deck drainage. At a minimum, these offsets should be ground down prior to allowing access by the public.

$2K
- Some trench drain grates in the deck are broken and should be repaired prior to the 2016 swim season.

$5K
- The trench drains do not drain quickly enough and should have the trench drain discharge piping cleaned out to prevent ponding on the deck.

$2K
- Additional painted-on depth/warning markings should be added around the perimeter of the pool in order to meet requirement of the IDPH. Depth markings shall be spaced at no more than 20 feet, "no diving" markings shall be at no more than 25 feet, and "max. depth" marking should be added.

$15K
- The existing 1-meter diving board does not have enough pool water depth for its continued use by the public based on the minimum depth requirements of the state of Iowa. However, it appears that the existing depths would accommodate a 2/3 M board.

Recommended specific improvements for an additional 10 years of facility operations. Total: $655K

$260K ***Pool Water Treatment Systems***

- Replace filters, pool heaters, pumps, pump motor starters, strainers, chemical controllers, valves, flowmeters, associated piping, and associated electrical.
- Install a pump pit.
- Install a backwash tank (for new sand filters)
- Install new manual fill and auto-fill systems
- Install additional pipe supports to existing piping that remains
- Install labels to the pool mechanical components.
- Test recirculation piping associated with the plunge pool due to the current need to frequently add water.

$50K ***Pool Structures***

- Route out and caulk pool joints.
- Install hydrostatic relief valve in floor near to where the existing floor joint caulk is regularly compromised.
- Check electrical bonding in embedded metallic pool embeds.
- Check underwater lights for broken conduits.
- Replace plunge pool tiles with new.
- Replace zero-depth grating.
- Repair plaster coating where delamination is occurring and where evidence of rebar near to the surface occurs.

$165K ***Bathhouse and Filter Building Structures***

- Paint bathhouse and filter buildings and replace rot.
- Replaced all shower fixtures.
- Add ADA showers (w/bench).
- Replace most electrical work within the filter building to accommodate new equipment.
- Tuck-point columns and some areas of exterior walls.
- Add weeps at bottom of block walls
- Clean and seal exterior surfaces of block walls
- Install new shingles on roofs of buildings
- Replace domestic water heaters.
- Install ceiling in guard room or barrier to womens room to provide security to womens room.
- ADA room signage
- Paint interior walls and doors.

$180K ***Pool Deck and Site***

- Replace slabs (or possibly mud-jack) settled front entry slabs.
- Remove baby pool structure and replace with grass deck.
- Add sunshades around deck.
- Replace trench drains and/or extend drain discharge piping to daylight.
- Sandblast and paint slide structure.
- Route out and caulk deck joints.
- Touch-up black chain link fence.
- Replace lifeguard seats with new.
- Adjust 4’ tall chainlink fence fabric where bent.
- New overhead lighting if night swimming is desired.
- Patch areas of spalled/cracked concrete in deck.
- Check electrical bonding in deck items near to pool.
- Remove corrosion and re-paint slide tower.